REMARKS

The Amendment, filed in response to the Office Action mailed May 13, 2010, is believed to fully address all issues raised in the Office Action. Favorable reconsideration of the merits and allowance of the application are respectfully requested.

Disposition of Claims

Claims 1 and 3-9 are all the claims pending in the application. Claims 4-6 and 9 are withdrawn from consideration. Claims 1, 3, 7 and 8 have been considered and rejected.

In the instant Amendment, claims 6 and 9 are amended to correct typographical errors. No new matter is introduced.

Formalities

Applicant thanks the Examiner for rejoining SEQ ID NOs: 2, 4, 6, 8, 10, and 12 and fully examining them for patentability under 37 CFR 1.104.

Applicant further thanks the Examiner for withdrawing the previous rejection of claims 1-2 and 7-8 under 35 U.S.C. 102(b) over Adarem et al WO 2002/085933A1 in view of applicants amendments.

Response to Rejection - 35 USC § 102

In the office Action, claims 1 and 7-8 are rejected under 35 U.S.C. 102(b) as allegedly being anticipated by (Amaro et al Current Microbiology Vol. 25 (1992) pgs. 99-104).

The Examiner asserts that Amaro et al teach lipopolysaccharides isolated from *Vibrio vulnificus* strains; teaches antisera against *Vibrio vulnificus* which was produced intravenously with said whole cell lysates; and thus the immunogenic lipopolysaccharides of *Vibrio vulnificus*

strains isolated from whole cell lysates and outer membrane fragments of Amaro et al necessarily encompasses isolated bacterial flagellins from *Vibrio vulnificus*.

With regard to the recitation "mucosal vaccine adjuvant" of the claims, the Examiner asserts that such recitation is considered as an intended use and thus is given no patentable weight.

Applicant respectfully disagrees.

Applicant does not agree with the Examiner's characterization of Amara and reasoning. It appears that the Examiner considered isolated immunogenic lipopolysaccharides contains flagelin. Applicant respectfully argue that the characterization of Amaro by the Examiner is flawed for the following reasosn.

First, Amaro teaches lipopolysaccharide of *Vibrio vulnificus*, which is different from flagelin. Flagelin is a structural component of a flagellum and is a protein. Amaro obtained lipopolysaccharides extracts from *Vibrio vulnificus* by different methods (i.e., whole-cell extraction (Fig. 1); proteinase K digestion of whole-cell lysate (Fig. 3 and 4); and extracted from outer membranes and supernatants of *Vibrio vulnificus* (Fig. 2)). Amaro isolated and purified lipopolysaccharides by electrophoresis (page 100, right column), indicating that the purified lipopolysaccharides does not contain flagelin.

Related portions are reproduced below.

LPS extractions from extracellular products. Cellophane plates were prepared with TSA (1% NaCl) as follows: after the medium was poured and solidified, an ordinary wrapping cellophane, previously sterilized, was placed on it [12]. About two drops of 24-h TSB cultures were spread over the cellophane, and cells were recovered after 24 h incubation with PBS. Extracellular products (ECPs) were obtained after removing bacterial cells through nitrocellulose filters of 0.22-μm pore size. Samples were mixed (1 : 1) with 2× electrophoresis sample buffer [11], boiled for 5 min, and digested with proteinase K (Boehringer Mannheim) during 1 h at 60°C. A volume of ECP of 20 μl was applied to each gel well to test for the presence of LPS.

Electrophoresis of LPS. LPS extractions were fractioned in SDS–PAGE according to Laemmli [11]. Running gels (12.5% acrylamide) were prepared at pH 6.8 and 8.8 according to Duchesne et al. [6]. The silver-stain technique of Tsai and Frasch [23] was used to visualize the LPS bands. We included purified lipopolysaccharide from *Vibrio cholerae* 569B (Sigma) as positive control for silver staining.

Second, in Amaro, the isolated lipopolysaccharides (or lipopolysaccharides extracts) were not used to produce antisera. Amaro produced antisera against cells inactivated with formalin of *Vibrio vulnificus* E22 (page 100, right column "Antisera"; Fig. 3) and *Vibrio vulnificus* E109. Then, Amaro immunoblotted the purified lipopolysaccharides obtained by proteinase K digestion of whole-cell lysates of *Vibrio vulnificus* with the antisera. That is, the antisera were not obtained using the isolated lipopolysaccharides extracts. Therefore, the Examiner's assertion that the immunogenic lipopolysaccharides isolated from whole cell lysates and outer membrane fragments of Amaro necessarily encompasses isolated bacterial flagellins from *Vibrio vulnificus* is flawed.

Relevant portion of Amaro is reproduced below.

Antisera. Rabbit antisera against *Vibrio vulnificus* were produced by intravenous injection of formalin-killed whole cells from ATCC 33149, E 22, and E 109, and sera were obtained as previously described [21]. Slide agglutination assays were conducted to examine the serological relationships between both biotypes, with the whole cells and the thermostable somatic "O" antigen obtained as previously described [21].

In this regard, even if assuming the antisera were obtained using cell lysate, Applicant submits that this does not satisfy the recitation "isolated flagelin" of the claims of the instant application, because the cell lystate does not contain "isolated" flagelin.

In addition, the flagellin defined in claims of the instant application is distinguished from lipopolysaccharides(LPS) as follows:

LPS are large molecules consisting of a lipid and a polysaccharide joined by a covalent bond to form bacterial outer membrane, and bind to the CD14/TLR4/MD2 receptor complex (LPS recognized by TLR4). They prevent the releasing of intracellular enzymes to the outside of a cell and protect the cell by blocking foreign substrates from passing through.

The flagellin is a protein that arranges itself in a hollow cylinder to form the filament in bacterial flagellum, which is a bacterial locomotive organ, and recognized by TLR5.

Accordingly, it is crystal clear that the rejection cannot be sustained, and its withdrawal is respectfully requested.

Response to Claim Rejections - 35 USC § 112

In the Office Action, claims 1, 3, 7-8 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter

which applicant regards as the invention. In particular, the Examiner asserts that claim 1 is indefinite by reciting "**A** mucosal vaccine adjuvants."

The Examiner also asserts that dependent claim 3 is indefinite by reciting "one or more selected from the group consisting of the peptides," because independent claim 1 states "mucosal vaccine adjuvants."

In response, Applicant notes that claim 1, as amended on March 4, 2010, recites "A mucosal vaccine adjuvant." It appears that the Examiner did not recognize the letter "s" of the word "adjuvants" in claims 1 and 3 was stricken out in the Amendment filed March 14, 2010.

The clean version of claim 1 included in the instant amendment shows the correct spell. Therefore, withdrawal of the rejection is respectfully requested.

Information Disclosure Statement

Applicant submits herewith an Information Disclosure Statement citing a copy of Indian patent office communication and related statements.

Conclusion

In view of the above, reconsideration and allowance of this application are now believed to be in order, and such actions are hereby solicited. If any points remain in issue which the Examiner feels may be best resolved through a personal or telephone interview, the Examiner is kindly requested to contact the undersigned at the telephone number **202-775-7588**.

The USPTO is directed and authorized to charge all required fees, except for the Issue Fee and the Publication Fee, to Deposit Account No. 19-4880. Please also credit any overpayments to said Deposit Account.

Respectfully submitted,

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